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Serial No. 10/696,019In the ClaimsRECEIVED
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1 (currently amended). An isolated, recombinant, or purified polypeptide comprising:

- a) SEQ ID NO: 3;
- b) a polypeptide fragment of SEQ ID NO: 3, said polypeptide fragment comprising between 5 and 88 contiguous amino acids of SEQ ID NO: 3 as set forth in Table 2;
- c) a heterologous polypeptide fused, in frame, to a polypeptide comprising SEQ ID NO: 3 or a polypeptide fragment of SEQ ID NO: 3, said polypeptide fragment comprising between 5 and 88 contiguous amino acids of SEQ ID NO: 3 as set forth in Table 2;
- d) a multimeric construction comprising SEQ ID NO: 3 or a polypeptide fragment of SEQ ID NO: 3, said polypeptide fragment comprising between 5 and 88 contiguous amino acids of SEQ ID NO: 3 as set forth in Table 2.
- a) SEQ ID NO: 2;
- b) SEQ ID NO: 3;
- c) SEQ ID NO: 4;
- d) ~~fragments of SEQ ID NOs: 2, 3, or 4;~~
- e) ~~a polypeptide as set forth in Tables 1, 2, or 3;~~
- f) ~~a variant polypeptide of SEQ ID NO: 2, 3, or 4, wherein said variant polypeptide specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4;~~
- g) ~~a variant polypeptide fragment of SEQ ID NO: 2, 3, or 4, wherein said variant polypeptide fragment specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4 or a fragment of SEQ ID NO: 2, 3, or 4;~~
- h) ~~a variant of a polypeptide as set forth in Table 1, 2 or 3, wherein said variant polypeptide specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4 or a polypeptide as set forth in Table 1, 2 or 3;~~
- i) ~~a heterologous polypeptide fused, in frame, to a polypeptide comprising: 1) SEQ ID NO: 2, 3, or 4; 2) fragments of SEQ ID NO: 2, 3, or 4; or 3) a polypeptide as set forth in Tables 1, 2 or 3;~~
- j) ~~a multimeric construct comprising: a) SEQ ID NO: 2, 3 or 4; b) fragments of SEQ ID NO: 2, 3 or 4; c) combinations of SEQ ID NO: 2, 3, 4, or fragments or variants thereof;~~

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2 (original). A composition comprising at least one isolated, recombinant, or purified polypeptide according to claim 1 and an additional component.

3 (original). The composition according to claim 2, wherein said additional component is a solid support.

4 (original). The composition according to claim 3, wherein said solid support is selected from the group consisting of microtiter wells, magnetic beads, non-magnetic beads, agarose beads, glass, cellulose, plastics, polyethylene, polypropylene, polyester, nitrocellulose, nylon, and polysulfone.

5 (original). The composition according to claim 2, wherein said additional component is a pharmaceutically acceptable excipient.

6 (currently amended). The composition according to claim 3, wherein said solid support provides an array of polypeptides and said array of polypeptides is selected from the group consisting of:

- a) SEQ ID NO: 3;
 - b) a polypeptide fragment of SEQ ID NO: 3, said polypeptide fragment comprising between 5 and 88 contiguous amino acids of SEQ ID NO: 3 as set forth in Table 2;
 - c) a heterologous polypeptide fused, in frame, to a polypeptide comprising SEQ ID NO: 3 or a polypeptide fragment of SEQ ID NO: 3, said polypeptide fragment comprising between 5 and 88 contiguous amino acids of SEQ ID NO: 3 as set forth in Table 2;
 - d) a multimeric construction comprising SEQ ID NO: 3 or a polypeptide fragment of SEQ ID NO: 3, said polypeptide fragment comprising between 5 and 88 contiguous amino acids of SEQ ID NO: 3 as set forth in Table 2; and
 - e) combinations of said polypeptides.
- a) SEQ ID NO: 2;

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- b) SEQ ID NO: 3;
- c) SEQ ID NO: 4;
- d) fragments of SEQ ID NOs: 2, 3, or 4;
- e) a polypeptide as set forth in Tables 1, 2 or 3;
- f) a variant polypeptide of SEQ ID NO: 2, 3, or 4, wherein said variant polypeptide specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4;
- g) a variant polypeptide fragment of SEQ ID NO: 2, 3, or 4, wherein said variant polypeptide fragment specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4 or a fragment of SEQ ID NO: 2, 3, or 4;
- h) a variant of a polypeptide as set forth in Table 1 or 2, wherein said variant polypeptide specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4 or a polypeptide as set forth in Table 1 or 2;
- i) a heterologous polypeptide fused, in frame, to a polypeptide comprising: 1) SEQ ID NO: 2, 3, or 4; 2) fragments of SEQ ID NO: 2, 3, or 4; or 3) a polypeptide as set forth in Tables 1 or 2; and
- j) combinations of said polypeptides and variants.

7 (original). The composition of claim 6, further comprising an additional antigen of interest.

8 (withdrawn-currently amended). A method of binding an antibody to a polypeptide comprising contacting a sample containing an antibody with a polypeptide according to claim 1 under conditions that allow for the formation of an antibody-antigen complex, wherein said polypeptide is selected from the group consisting of:

- a) SEQ ID NO: 2;
- b) SEQ ID NO: 3;
- c) SEQ ID NO: 4;
- d) fragments of SEQ ID NOs: 2, 3 or 4;
- e) a polypeptide as set forth in Tables 1, 2 or 3;
- f) a variant polypeptide of SEQ ID NO: 2, 3, or 4, wherein said variant polypeptide

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specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4;
 -----g) a variant polypeptide fragment of SEQ ID NO: 2, 3, or 4, wherein said variant polypeptide fragment specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4 or a fragment of SEQ ID NO: 2, 3, or 4;
 -----h) a variant of a polypeptide as set forth in Table 1, 2 or 3, wherein said variant polypeptide specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4 or a polypeptide as set forth in Table 1, 2 or 3;
 -----i) a heterologous polypeptide fused, in frame, to a polypeptide comprising: 1) SEQ ID NO: 2, 3, or 4; 2) fragments of SEQ ID NO: 2, 3, or 4; or 3) a polypeptide as set forth in Tables 1, 2 or 3; and
 -----j) mixtures of polypeptides as set forth in a), b), c), d), e), f), g), h), or i).

9 (withdrawn). The method according to claim 8, further comprising the step of detecting the formation of said antibody-antigen complex.

10 (withdrawn-currently amended). The method according to claim 8 claim 9, wherein said method is an immunoassay.

11 (withdrawn). The method according to claim 10, wherein said immunoassay is selected from the group consisting of enzyme linked immunosorbent assays (ELISAs), radioimmunoassays (RIAs), lateral flow assays, immunochromatographic strip assays, automated flow assays, Western blots, immunoprecipitation assays, reversible flow chromatographic binding assays, agglutination assays, and biosensors.

12 (withdrawn). The method according to claim 8, wherein said method is performed using an array of polypeptides.

13 (withdrawn). The method according to claim 12, wherein said array of polypeptides comprises the same polypeptide.

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14 (withdrawn-currently amended). The method of claim 12, wherein said array of polypeptides comprises the same or different epitopes of the polypeptide of SEQ ID-NOs: ~~2, 3, or 4~~ NO: 2.

15 (withdrawn). The method of claim 12, wherein said array of polypeptides further comprises isolated polypeptides from other organisms of interest.

16 (withdrawn). The method of claim 15, wherein said other organisms of interest are selected from the group consisting of *Borrelia burgdorferi*, *Ehrlichia canis*, *Ehrlichia chaffeensis*, *Ehrlichia ruminantium*, *Anaplasma marginale*, and combinations of said organisms of interest.

17 (withdrawn-currently amended). In a method of detecting the presence of antibodies that specifically bind to *Anaplasma phagocytophilum* or antigens thereof, the improvement comprising the use of at least one isolated, recombinant, or purified polypeptide according to claim 1, comprising:

- a) SEQ ID NO: 2;
- b) SEQ ID NO: 3;
- c) SEQ ID NO: 4;
- d) fragments of SEQ ID-NOs: ~~2, 3, or 4~~;
- e) a polypeptide as set forth in Tables 1, 2 or 3;
- f) a variant polypeptide of SEQ ID NO: ~~2, 3, or 4~~, wherein said variant polypeptide specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: ~~2, 3, or 4~~;
- g) a variant of a polypeptide fragment of a polypeptide fragment of SEQ ID NO: ~~2, 3, or 4~~, wherein said variant polypeptide fragment specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: ~~2, 3, or 4~~, a fragment of SEQ ID NO: ~~2, 3, or 4~~, or a polypeptide as set forth in Table 1, 2 or 3;
- h) a variant of a polypeptide as set forth in Table 1, 2 or 3, wherein said variant polypeptide specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: ~~2, 3, or 4~~ or

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a polypeptide as set forth in Table 1, 2 or 3;

----- i) a heterologous polypeptide fused, in frame, to a polypeptide comprising: 1) SEQ ID NO: 2, 3, or 4; 2) fragments of SEQ ID NO: 2, 3, or 4; or 3) a polypeptide as set forth in Table 1, 2 or 3; or
----- j) a combination of polypeptides as set forth in a), b), c), d), e), f), g), h), or i);

18-36 (canceled).

37 (withdrawn-currently amended). A method of inducing an immune response comprising the administration of a polypeptide according to claim 1 to an individual the administration of:

----- 1) a polypeptide antigen comprising:

----- a) SEQ ID NO: 2;

----- b) SEQ ID NO: 3;

----- c) SEQ ID NO: 4;

----- d) fragments of SEQ ID NOs: 2, 3, or 4;

----- e) a polypeptide as set forth in Table 1, 2 or 3;

----- f) a variant polypeptide of SEQ ID NO: 2, 3, or 4, wherein said variant polypeptide specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4;

----- g) a variant polypeptide fragment of SEQ ID NO: 2, 3, or 4, wherein said variant polypeptide fragment specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4 or a fragment of SEQ ID NO: 2, 3, or 4;

----- h) a variant of a polypeptide as set forth in Table 1, 2 or 3, wherein said variant polypeptide specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4 or a polypeptide as set forth in Table 1, 2 or 3;

----- i) a heterologous polypeptide fused, in frame, to a polypeptide comprising: 1) SEQ ID NO: 2, 3, or 4; 2) fragments of SEQ ID NO: 2, 3, or 4; or 3) a polypeptide as set forth in Table 1, 2 or 3; and

----- j) mixtures of polypeptides as set forth in a), b), c), d), e), f), g), h), or i);

----- 2) a polynucleotide encoding at least one polypeptide antigen that is selected from the group consisting of:

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- n) SEQ ID NO: 2;
- b) SEQ ID NO: 3;
- c) SEQ ID NO: 4;
- d) fragments of SEQ ID NO: 2, 3, or 4;
- e) a polypeptide as set forth in Table 1, 2 or 3;
- f) a variant polypeptide of SEQ ID NO: 2, 3, or 4, wherein said variant polypeptide specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4;
- g) a variant polypeptide fragment of SEQ ID NO: 2, 3, or 4, wherein said variant polypeptide fragment specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4 or a fragment of SEQ ID NO: 2, 3, or 4;
- h) a variant of a polypeptide as set forth in Table 1, 2 or 3, wherein said variant polypeptide specifically binds to an antibody that specifically binds to a polypeptide of SEQ ID NO: 2, 3, or 4 or a polypeptide as set forth in Table 1, 2 or 3;
- i) a heterologous polypeptide fused, in frame, to a polypeptide comprising: 1) SEQ ID NO: 2, 3, or 4; 2) fragments of SEQ ID NO: 2, 3, or 4; or 3) a polypeptide as set forth in Table 1, 2 or 3; and
- j) mixtures of polypeptides as set forth in a), b), c), d), e), f), g), h), or i); or
- 3) the administration of at least one of said polypeptide antigens and at least one of said polynucleotides encoding an antigen.

38 (new). The polypeptide according to claim 1, wherein said polypeptide comprises SEQ ID NO: 3.

39 (new). The polypeptide according to claim 1, wherein said polypeptide comprises a polypeptide fragment of SEQ ID NO: 3, said polypeptide fragment comprising between 5 and 88 contiguous amino acids of SEQ ID NO: 3 as set forth in Table 2.

40 (new). The polypeptide according to claim 39, wherein said polypeptide comprises SEQ ID NO: 2.

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41 (new). The polypeptide according to claim 39, wherein said polypeptide comprises SEQ ID NO: 4.

42 (new). The polypeptide according to claim 1, wherein said polypeptide comprises a heterologous polypeptide fused, in frame, to a polypeptide comprising SEQ ID NO: 3 or a polypeptide fragment of SEQ ID NO: 3, said polypeptide fragment comprising between 5 and 88 contiguous amino acids of SEQ ID NO: 3 as set forth in Table 2.

43 (new). The polypeptide according to claim 1, wherein said polypeptide comprises a multimeric construction comprising SEQ ID NO: 3 or a polypeptide fragment of SEQ ID NO: 3, said polypeptide fragment comprising between 5 and 88 contiguous amino acids of SEQ ID NO: 3 as set forth in Table 2.

44 (new). The polypeptide according to claim 1, wherein said polypeptide has one or more of the following properties or activities: a) the ability to specifically bind to antibodies specific for SEQ ID NO: 2, 3, 4; b) the ability to specifically bind antibodies found in an animal or human infected with *A. phagocytophilum*; c) the ability to bind to, and activate T-cell receptors in the context of MHC Class I or Class II antigen that are isolated or derived from an animal or human infected with *A. phagocytophilum*; d) the ability to induce an immune response in an animal or human; e) the ability to induce a protective immune response in an animal or human against *A. phagocytophilum*; or f) the ability to direct the extracellular secretion of a polypeptide attached to a polypeptide comprising SEQ ID NO: 4.